GRANITES OF VERMONT

As Located in Quarries Outside of Barre

WHAT AND WHERE FOUND

As Described by The Monumental News. Many Quarries Throughout the Eastern Part of the State.

The Monumental News in its January issue describes the granites of Vermont, other than those in Barre, as follows:—

The granite industry of Vermont owes no small part of its present prosperity in "granite railroads," which connect not only groups of quarries, but every quarry in each group with the main line, although these quarries are situated at considerable elevations and are inconveniently related to one another.

The quarries of Caledonia county are in the towns of Hardwick, Kirby, Newark, Ryegate and Groton.

The Buffalo Hill quarry is on Buffalo Hill about two and one-half miles southwest from Hardwick village and about 500 feet above it; operator, Hardwick Granite Company, Hardwick, Vt.

The granite "Dark-blue Hardwick," is a quartz monzonite of dark gray shade, a little darker than "Dark Barre," and a trifle lighter than "Dark Quincy." Its texture is medium, with feldspars up to 0.3 inch and mica to 0.2 inch, generally even grained, but with sparse, clear, porphyritic feldspars up to 0.4 inch, inclosing the feldspars, quartz and mica.

This is a bright stone with strong contrast between the white feldspar and black mica. It takes a fair polish, and hammers light with marked contrast to the polished face, which shows some pyrite and less magnetite. The quarry, opened about 1887, is a small irregular opening 20 to 30 feet deep. It is a bowlder quarry without sheets. The plant consists of one-horse derrick. The transportation is by cart two and one-half miles to Hardwick. The product is used for monuments, particularly for polished and rock-faced work.

The quarries at Kirby are all at Kirby Mountain in the east part of the township and about nine miles northeast of St. Johnsbury. The Grout quarry is on the south side of Kirby Mountain in Kirby. Operators, Carlton & Lake, East St. Johnsbury, Vt.

This is a bright stone, but the fineness of its mica and the light shade of its quartz preclude strong contrasts.

The quarry, opened about 1899, consists of two openings; the northern and one 40 by 25 feet and 10 feet deep; the lower one 70 feet square and 3 to 5 feet deep. The plant consists of one-horse derrick and one hand derrick. Transportation is to cart five to six miles to rail at Concord. The product is used for monuments.

The Kearney Hill quarry is on the west foot of Kirby Mountain, about two and one-half miles south of North Concord. It is operated by the Kearney Hill Quarry company, Concord, Vt.

The plant consists of one hand derrick. Transportation is by cart five and one-half miles to a cutting firm and rail at Concord. The product is used for monuments.

The Burke quarry is on the west foot of Kirby Mountain in Kirby. Operator, Burke Granite company (incorporated), East Burke, Vt. The quarry measures about 175 by 100 feet and from 10 to 20 feet in depth. Transportation is by cart five and one-half miles to rail at Concord. The product is used for rough and cut monuments, and finds a market mostly in the West.

The Bugbee, Alexander & Packer prospect is in the eastern part of Newark. The intending operators are E. H. Bugbee and W. S. Alexander of Barre, and H. D. Packer of Newark, Vt.

The granite, "Newark pink," is a biotite granite of light pinkish gray color and of course, even-grained texture, with feldspars up to 0.3 inch and mica to 0.15 inch.

Ryegate.

The Ryegate quarries are on the southwest and northeast sides of Blue Mountain, a ridge with a northwest southeast trend situated about five miles west of Connecticut river in the east-central part of the town.

A mica shist crops out in the village of South Ryegate with a very steep dip, and appears to continue three miles north onto a bench on the southwest side of Blue Mountain and 770 to 800 feet above the village. The granite extends from the back or northeast part of the bench to the top of the ridge.

The granites of Blue Mountain are quartz monzonites and biotite granites of light and medium more or less bluish gray color and of medium, very rarely fine to medium, even-grained texture, and are used chiefly for rough or hammered monuments. All the quartz monzonites of Ryegate ought to cut light.

The Gibson quarry is on the southwest side of Blue Mountain, 940 feet above the village of South Ryegate. Operator, Ryegate Granite Works, So. Ryegate, Vt.

The granite is a quartz monzonite of light to medium gray shade and medium even-grained, texture with feldspars up to 0.4 inch and mica to 0.1 inch. The quarry opened in 1903, is about 200 feet square and from 2 to 4 feet deep. The plant consists of a derrick, hoisting engine, two air compressors, a steam drill, and two air-plug drills. Transportation is by cartage three miles to cutting sheds at South Ryegate, 940 feet lower. The product is used for monuments and bases, and to some extent for building.

The Morrison quarry is on the southwest side of Blue Mountain, in Ryegate. Operators, D. A. Morrison & Co., South Ryegate, Vt. This stone is identical with that of the Gibson quarry, but its contrasts are a little sharper, as the quarry had got down to thicker sheets. The quarry opened in 1900, measures about 400 by 200 feet, with an average depth of 20 feet. The plant consists of two horse derricks. Transportation is by cartage three miles to South Ryegate. The product is used for bases and hammered monuments.

The Italian quarry is on the southwest side of Blue Mountain. Operator, Caledonia Quarry Company, So. Ryegate, Vt. The plant consists of one horse derrick. The product is carried three miles to South Ryegate, and is used for bases and hammered monuments.

The Tupper quarry is on the southwest side of Blue Mountain. Operators, W. S. Tupper & Co., South Ryegate. The plant comprises one horse derrick. Transportation is by cartage three miles to South Ryegate, 950 feet lower. The product is used for bases and hammered monuments.

The Rosa quarry is on the northeast side of a southeast spur of Blue Mountain. Operator, Vermont Gray Granite Company, South Ryegate, Vt. The granite is of two kinds. The first is fine gray, a biotite, granite of medium gray shade and of fine inclining to medium, even-grained texture. Its general shade is a trifle darker than that of the quartz monzonite of the Morrison quarry. The fineness of the texture of this stone precludes mineral contrasts.

The other granite, "coarse gray," is a biotite granite of medium bluish gray shade, and medium, even-grained texture. This is also a trifle darker than that of the Morrison quarry. Its contrasts are stronger than those of the quartz monzonites of the Morrison and Gibson quarries. It contains more biotite. The quarry, opened in 1906, measures about 150 by 75 feet and from 10 to 25 feet in depth. The plant includes, at the quarry, a 45-ton derrick, a hoisting engine, a small air compressor for two plug drills, a large steam rock drill, and a steam pump, besides at the cutting shed a hand derrick and a 40-ton overhead crane. The product is carted nearly four miles to the cutting shed at South Ryegate, and is used for hammered and rock faced monuments and bases.

The Fraser quarry (formerly known as Hall's) is on the southwest side of the southeast spur of Blue Mountain. It was not in operation in 1907. The owner is Mrs. Margaret Hinchey, Hydeville, Vt. The plant comprises two horse derricks. The product must be carted three and one-half miles to South Ryegate.

Groton.

The Benzie quarry is in Groton about a mile from the Wells River bridge. Operators, McCrae, Benzie & Co., Groton, Vt. The granite, "Vermont blue," is a quartz monzonite of medium, very bluish gray color and even-grained medium inclining to the fine texture. This stone is brilliant and markedly bluish, but its mineral contrasts are feebl owing to fineness of texture and similarity in shade of feldspar and quartz. The quarry, opened in 1896, measures about 200 by 175 feet and from 40 to 60 feet in depth. The plant at the quarry consists of a 50-ton derrick, hoisting engine, steam pump, and large rock drill, to which were added in 1908 a 90-foot derrick and an air compressor with a capacity of 130 cubic feet of air per minute, sufficient for two large rock drills and four air plug drills. At the cutting shed there are two hand derricks, two steam derricks, an air compressor, two surfacers, 20 air hand tools, two steam engines, and three polishers. The product is carted one and one-half miles to the cutting shed at Groton. It is used for monuments and building. The fine stone of the granite dike is used for special orders and carved work. Examples are the Davidson monument at Woodsville, N. H., and the Dr. S. N. Eastman monument at Groton, Vt.

Topsham.

Granite was formerly quarried at two points in Topsham. One was very near the village of South Ryegate, the other on Pine Mountain about south-southeast of Groton. Hitchcock and Hager's geological map represents a granite area extending from Groton into Topsham, but it seems too far west. The Ricker quarry is in Topsham, at the west foot of Pine Mountain, roughly about five and one-half miles west-southwest of Blue Mountain. Owner is Isaac N. Ricker, Groton, Vt. The granite, "Pine Mountain," is a quartz monzonite of medium bluish gray color and medium somewhat even-grained texture. The stone is not quite so bluish as that of the Benzie quarry in Groton, nor its feldspars seem to be as evenly distributed. The quarry is about 40 by 32 feet and the working face on the east is 20 feet high from the road and quarry level. It has been idle a number of years.

Randolph.

Beedle's prospect is in the west corner of the town of Randolph between Bethel line and the west branch of White River. It is on the farm of A. H. Beede of Randolph, Vt. The granite, fine white granite, is a quartz monzonite of extremely light gray shade without any mica spots. It is lighter than "Dummerston white," but not as white as that of Bethel when the rough faces are compared, and its slight grayness has a tinge of green in it.

Orleans County.

The Newport Granite Company's quarry is near the center of the town of Derby and about four miles east of the city of Newport. Operator, George R. Farquharson, Newport, Vt. The granite is a quartz monzonite, with both biotite and muscovite, of light bluish gray color and even-grained, medium inclined to to fine texture. The shade of this stone is between that of "light Barre" and that of the granite of Hallowell, Me. It has more black mica than "light Barre" and stronger contrasts. The plant consists of one 40 ton and two 20-ton derricks, three hoisting engines, an air compressor capacity 292 cubic feet of air per minute), four large rock drills, fifteen air plug drills, and three steam pumps. The product is used for monuments and buildings, and finds its chief market in the West. Specimen: The prison ship martyrs' monument in Fort Greene Park, Brooklyn, N. Y. Height, 130 feet, shaft 18 feet in diameter at base and 14 feet at top.

The Parmenter quarry, visited in 1909 is in Derby township, near Beebe Plain, close to the Canada line. Operator, W. H. Parmenter, North Derby, Vt. The general shade of this granite is lighter than that of North Jay and darker than that of Bethel, or nearly the same as that of "West Dummerston white," but with more conspicuous black micas. The quarry recently opened, is 40 by 25 feet in area and 10 feet deep. The plant consists of one hand derrick.

Cabot.

The town of Cabot adjoins that of Woodbury on the southeast and of Walden on the northeast. Lambert's prospect is in the northern corner of the township, on the east side of a north-south ridge, roughly about four miles east of Robeson Mountain in Woodbury. Operator, Joseph Lambert, Mackaville, Hardwick, Vt. The granite is a quartz monzonite of dark bluish gray color (as dark as "dark Barre") and of even-grained fine texture. This stone is a little finer textured than some of the "dark Barre," and more micaceous.

Calais.

The town of Calais adjoints that of Woodbury on the southwest. The quarries are at Adamant (formerly known as Sodom) in the west corner of the town and six miles north-east of Montpelier. The quarries lie along a N. 30 degress E. line on the southeast side of a granite ridge. The granite is a biotite granite of medium and light-gray shade and fine texture.

The Patch quarry is within one-half mile of Adamant, in Calais. Operators, Patch & Co., Montpelier, Vt. This granite is of the same shade as "medium Barre" but of less bluish and more greenish tinge. Its mineral contrasts are stronger and its texture a little coarser. Its large clear feldspars give brilliancy to its rough surface. The quarry opened about 1893, is estimated as measuring 250 feet from north to south by 150 feet across and from 20 to 50 feet in depth. The plant comprises three 20-ton derricks, a hoisting engine, an air compressor, five air plug drills and a large rock drill. The product is used for monuments and finds already market chiefly in the Middle West.

The Lake Shore quarry is about 1,200 feet S. 32 degress W. from the Patch quarry near Adamant in Calais. Operator, Lake Shore Quarry Company, Montpelier, Vt. This stone is a trifle darker than "light Barre" and a trifle lighter than "medium Barre." Its shade corresponds to that of the granite of Hallowell, Me., but its contrasts are stronger. The plant comprises a derrick, hoisting engine, air compressor, a large rock drill, three air plug drills, and a pulsometer pump. Transportation is by cart, seven miles to Montpelier. The product is used for monuments and buildings.

The Eureka quarry is about 900 feet from the Patch quarry. Operator, Eureka Granite Company (Clark Sibley), Montpelier, Vt. The granite is presumably identical with that of the Patch quarry.

The township of Woodbury lies northeast of Calais, northwest of Cabot, and southwest of Hardwick. Its principal quarries are on the southeast flank of Robeson Mountain, about a mile east of Woodbury Center and three miles northeast of Woodbury Pond. Robeson Mountain is a ridge about a mile long. Its top is from 300 to 400 feet above the hollows on either side and 930 feet aobve Woodbury Pond and about 1,100 feet above the railroad at Hardwick. Granite has also been quarried on the ridges on on the northwest and southeast sides of Buck Pond, and is now quarried on the rising ground at the head of the hollow on the north side of Robeson Mountain.

"Woodbury Granite."

The "Woodbury granites" are all biotite granites of more or less bluish gray shade, ranging from dark to light (one very light cream color), and in texture from very fine to medium. They fall into four kinds, but, taking account of minor differences, into nine varieties. Most of them possess in large masses one general characteristic. They carry sparse, more or less incomplete, crystals up to an inch across of clear potash feldspar formed about the minerals. There is some parallelism between these crystals, for seen at a certain angle the cleavage planes of adjoining crystals reflect the light alike. The granites of Robeson Mountain vary from light to medium gray shade and from medium to fine, inclining to medium, porphyritic texture. The general differences between the three varietis of granite on Robeson Mountain are these: In the stone from the Fletcher quarry the feldspar and quartz areas are rather large and well defined by differences of shade. In the stone from the Woodbury Lower quarry the quartz areas are finer, fewer, and less smoky. In the "Bashaw" the texture is finer and contrasts weaker than in either of the others. The fine dark gray of the new Drenan and Webber openings and of another near Buck Pond is of dark bluish-gray shade and fine texture. Its general shade is like that of "dark Barre," but its texture is finer.

The stone from the Nichols Ledge quarry is of light inclining to medium bluish gray shade and of very fine texture. This is lighter and finer than the last. Finally, there is the very light, slightly cream colored constructional granite of the prospect between Robeson Mountain and Buck Pond. The usual range in thickness of sheets is from 2 to 8 or 20 feet; the extremes are 1 to 40 feet.

Fletcher Quarry.

The Fletcher quarry is on Robeson Mountain near its west southwest end and on its southeast side, in Woodbury. Operator, E. R. Fletcher, Hardwick, Vt. The granite, "Woodbury gray," is a biotite granite of light-gray shade (between "light Barre" and the granite of Hallowell, Me.) and of medium texture with feldspars up to 0.3 inch and mica to 0.1 inch. This is a brilliant granite with marked mineral contrasts. The quartz and feldspar areas are rather large and well defined. The polish is poor owing to the large size of the micas. The quarry, opened about 1887, is estimated as measuring 300 feet in a northwest direction or across the ridge, by 300 along it and from 20 of 40 in depth. It is practically the beginning of a cross section of the ridge and dome. Near its west southwest end the Fletcher quarry cuts the ridge of Robeson Mountain from southeast to northwest. The sheets exposed here are from 1 to 5 feet thick, horizontal at the top of the ridge, but curving over on the southeast with a dip of 15 degrees to 30 degrees, and determining the slope of the ridge on that side. These sheets are, however, intersected by another set from 5 to 9 feet thick, dipping 5 degrees to 10 degrees S. 70 degrees W. in the direction of the axis of the ridge. In the Woodbury Granite company's quarries, roughly about 1,750 feet N. 80 degrees E. of the Fletcher quarry, the sheets at the top of the ridge turn, dipping to the northern horizon. Lower down on the southeast side of the ridge they are from 2 to 18 feet thick and dip 20 degrees SSE., with an intersecting set of the Fletcher quarry.

The only explanation offered for this double sheet structure is the existence at some time of a secondary compressive strain operating differently from that which produced the primary sheet structure to which the ridge owes its form, and giving rise to a nearly horizontal set of joints as sheet partings. There is now a marked compressive strain in the Fletcher quarry, operating from northeast to southwest, parting the sheets and giving rise even in the upper part of the quarry to horizontal strain features. Its existence lends support to such an expansion. In 300 granite quarries visited thus far by the writer this is the first case of double sheet structure or horizontal jointing observed.

The plant comprises, at the quarry two derricks and a large rock drill, at the cutting shed at Hardwick, a 10-ton and a 10-ton derrick, a hoisting engine, a 10-ton locomotive crane, a 40-horsepower engine, and three polishers. Transportation is effected by siding from the Hardwick and Woodbury railroad, which brings the stone eight miles to the cutting shed, and to the St. Johnsbury and Lake Champlain railroad.

Woodbury Granite Company's Quarries.

The Woodbury Granite company's quarries are on Robeson Mountain, roughly from 1,400 to 2,100 feet from the Fletcher quarry in Woodbury. Operator, Woodbury Granite company, Hardwick, Vt.

The granite is of two sorts. "Woodbury gray" is a biotite granite of medium gray shade and medium texture with feldspar up to 0.3 inch and mica to 0.1 inch.

This stone to the eye is like that of the Fletcher quarry, except that its quartz particles are a little finer, less numerous and less smoky. Its mineral contrasts are, therefore, weaker. The polish is poor, owing to abundant and rather large mica scales, but the contrasts on the polished face are strong.

The other sort, "Woodbury Bashaw," is a biotite granite of medium gray shade (about like that of "Concord granite," but more bluish and with more contrasts,) and of fine inclining to medium texture with feldspars up to 0.2 inch and mica to 0.1. This is a monumental granite. Its mineral contrasts are not as marked either in the rough or the polish as in the "Woodbury gray." This is due to the feldspars being less kaolinized and thus less white. Its texture is finer and it polishes better. Three compression tests of the "Woodbury gray" made for the firm at the United States Arsenal at Watertown, Mass., yielded an average of 20,805 pounds per square inch.

The quarries consist of four openings: The main and western one, made in 1880, beginning at the south foot of the ridge extends about 500 feet along it and 400 feet northward up its side, with an average depth of 50 feet. The "upper quarry," above the north of the main one, is about 200 feet square, and its north side is at the top of the hill nearly 200 feet higher than the lower edge of the main quarry. The third opening, about 800 feet east of the main one, made in 1906, is about 125 by 70 feet and from 10 to 30 feet deep. This produces the finer monumental granite, "Woodbury Bashaw." The fourth is a small opening made in 1907, about 200 feet northwest of the third.

The sheets at the top of upper quarry and of the ridge are horizontal. In the third opening they are from 3 to 13 feet thick, ill defined, and about horizontal. In the main quarry they range from 2 to 18 feet, exceptionally 23 feet and even 40, curving over from the horizontal to dip 20 degrees S. They are intersected by a horizontal set. The plant at the quarries comprises a 75-ton, a 50-ton, three 40-ton, a 30 ton, and two 20 ton derricks, seven hoisting engines, three Blondin carriers with two engines and cables 1,200, 800 and 700 feet loud to carry waste to the dumps in the valley, an air compressor (capacity 1,160 cubic feet of air per minute), five large rock drills, twenty-four air plug drills, and eight hollow-steel drills "bull machines") for blowing out powdered granite. The ricks, two overhead 20 and 40-ton cranes, an out-door overhead traveling 30-ton crane operated on a trestle 575 feet long and of 75 foot span to facilitate storage of finished stones and rapid loading of cars; two air compressors (capacity 1,000 and 500 cubic feet of air per minute,) eleven air plug drills, 65 air hand tools, six surfacers, a polisher, four lathes for stones 35 by 4 feet, 13 feet by 2 feet 6 inches, 12 by 2 feet, and 12 feet by 1 foot; two polishing lathes for stones 25 by 5 and by 3 feet, two saws for stones 10 by 8 feet and 16 by 6 by 7 feet, two MacDonald combined planers and surfacers. Transportation is by siding from the Hardwick and Woodbury railroad, which brings the stone eight miles to the cutting shed, and the St. Johnsbury and Lake Champlain railroad.

The Carson quarry is on the northeast foot of Robeson Mountain, in Woodbury. Operators, Carson Brothers, Woodbury, Vt. The granite is a biotite granite similar to that of the main quarry of the Woodbury Granite company. Transportation is by cart, one-third of a mile to the Hardwick and Woodbury railroad.

The Ainsworth quarry is on the northeast foot of Robeson Mountain, in Woodbury, about 1,000 feet northeast of the railroad. Operators, Ainsworth & Ainsworth, Woodbury, Vt. The granite is a biotite granite similar to that of the main quarry of the Woodbury Granite company. The plant comprises a hand and a horse derrick. The stone has to be carried 1,000 feet or more to rail.

The Miller quarry is about 500 feet west-southwest of the last. Operator, O. F. Miller, Woodbury, Vt. This is a small opening of recent date.

The Drenan quarries are in Woodbury, on the rising land north of the east end of Robeson Mountain. The granite of the new opening now worked, "Woodbury fine dark gray," is a biotite granite of dark bluish gray shade and fine texture. This is a monumental granite of the same shade as "dark Barre," but of finer texture. It is darker than any of the kranites of Robeson Mountain. The plant consists of three hand derricks, an air compressor run by a gasoline engine.

Within a few hundred feet west of the old Drenan openings there is a considerable ledge which has been prospected for building granite.

The Webber quarries are in Woodbury, still farther north of Robeson, on a mass which is continuous with that on the southeast side of Buck Pond. Operator, Webber Granite company, Hardwick, Vt.

The granite of the main and other opening knows generally as "Woodbury gray," is slightly more bluish and finer textured than the gray of the main quarry of the Woodbury Granite company and lighter in shade than their "Bashaw," and a trifle darker than "light Barre." The stone of an opening made in 1907 is a monumental granite of dark bluish color corresponding to "dark Barre" but of finer texture. The plant comprises one hand and two horse derricks, an air compressor, a large rock drill, and three air plug drills.

Fyratt & Carr, of Woodbury, in 1907 were quarrying bowling and possibly surface sheets a little south of the Webber quaries.

Between the southwest end of Buck Pond and the new Webber quarry, roughly 500 feet north of the latter, is an abandoned quarry of biotite granite of dark bluish gray shade and fine texture.

The Chase quarries are on the first high bluff northwest of Robeson Mountain, over 500 feet northwest of Buck Pond and 200 feet above it. They have been idle for several years.

The Nichols Ledge Carter quarry is at the northeast foot of Nichols Ledge in the east corner of the town of Woodbury. Operator, J. H. McLeod, Hardwick, Vt. It was not worked in 1907.

Dummerston.

The Dummerston granite area lies five and six miles north-northwest of Brattleboro. The quarries and prospects are in the southwest part of the town on the side of Black Mountain, and also half a mile south-southwest of it. Black Mountain is a roundish granite mass, probably of dome structure, a square mile area, and from 900 to 950 feet above West River, and 1,260 feet above sea level. The granites of Dummerston are quartz monzonites of very light gray and light bluish gray shade and of even grained medium or medium inclining to fine texture.

The Black Mountain quarry is at the southwest foot of Black Mountain. Operator, George E. Lyons Co., West Dummerston, Vt; main office, Monson, Mass. The granite, of two sorts, chiefly "West Dummerston white," is a quartz monzonite of very light gray shade, speckled with bronze-colored mica.

The other granite, "dark blue," is a quartz monzonite of light inclining to medium bluish gray color, and of even-grained fine inclining to medium texture. This is a monumental granite of light bluish gray tint and without mineral contrasts. The plant comprises thirteen derricks, one of them 20 tons, five hoisting engines, an air compressor, four large rock drills, a channel bar drill, and four air plug drills. Transportation is by two sidings from the Vermont Central railway. Stones for finishing are shipped to the firm's cutting plant, at Monson, Mass.

The Clark quarries are east of West Dummerston village, on the northwest side of Black Mountain. Operator, James Clark, West Dummerston, Vt. Used for paving and curbing.

The Bailey prospects are on the west side of West River, about one-half mile south-southwest of the Black Mountain quarry, in Dummerston. Owner, David J. Bailey, R. F. D., Brattleboro, Vt.

The quarries of Windsor county are in the towns of Bethel, Rochester, and Windsor.

Bethel.

The state map of 1861 represented a small granite area in the east corner of the town of Bethel. The granite exposure is reported as at least one-half mile long from north to south. Its width at the quarries is about 550 feet, with a border of finer less whitish granite on either side about 40 feet wide.

The granite known under the commercial name "Bethel white granite," which has been copyrighted, and the granite consequently called by another firm "Hardwick white granite," from the location of its main office, are one and the same. The two quarries, but a few feet apart, are excavations in granite of one mass of contemporaneous origin and of identical composition and texture.

The granite of Bethel and "Bethel white," or Hardwick white," is a quartz monzonite of slightly bluish milk-white color, with grayish spots up to 0.3 inch and of coarse inclining to medium texture, with feldspars up to 0.4 inch and 0.5 inch and mica to 0.3 inch. Three compression tests made at the United States Arsenal at Watertown, Mass., yielded an average of 33,000 pounds a square inch.

The stone is regarded as relatively hard by workmen. Its grade of whiteness is shown by these comparisons: The "white of North Jay, Me., is technically, very light gray. The "white of West Dummerston is a trifle lighter, that of Randolph lighter lighter yet, and that of Bethel still lighter, strictly white mottled with gray. Its white is more blue than ordinary Vermont white marble, but is closely allied to its blue variety, but not its bluish gray. Owing probably to the abundance of its soda-lime feldspar, its hammered face is considerably whiter than the rough face and the hammering also diminishes the prominence of the gray micaceous spots. It takes a high polish, but the effect is to make the mica spots more conspicuous than they are even on the rough face. Although this granite is remarkably free from iron, its recent use in large edifices shows that extreme care should be exercised in handling it to prevent it absorbing rusty water or other discoloring liquids.

Ellis Quarry.

The Ellis quarry is on the east side of Christian Hill, about two miles north of Bethel village in Bethel township. Operator, E. B. Ellis Granite company, Northfield, Vt. The granite has been described above. The plant at the quarry comprises ten derricks of 15 to 50 tons capacity, nine hoisting engines, an air compressor, eleven large air rock drills, twenty-eight air plug drills, and four steam pumps. The cutting plant at Northfield, Vt., comprises a 25-ton derrick and engine, a 50-ton derrick and electric motor, two 20- ton and one 10-ton overhead crane, taree air compressors (capacity, two of 800 and one of 300 cubic feet of air per minute), six air plug drills, one hundred and fifty air hand tools, eleven surfacers, two lathes for stones 20 by 3 by 2 feet; one Dietrich Harvey company turning and fluting machine for columns 40 by 7 feet. The cutting plant is run by five electric engines, two of 100, two of 75, one of 35, and one of 15-horsepower. Electricity is brought 14 miles from Mad River.

Transportation is effected by siding. Blocks destined for cutting are brought five miles to Bethel and thence 28 miles to the cutting shed at Northfield.

The Woodbury company's quarry is 50 feet north of the Ellis quarry, on the east side and top of Christian Hill, about two miles north of Bethel village. Operator, Woodbury granite company, Hardwick, Vt. The granite has been described. The plant at the quarry comprises five derricks (one with 90-foot mast, the rest with 50 to 75-foot masts), a Blondin carrier, two air compressors, (capacity 556 and 450 cubic feet of air per minute,) four large rock air drills, 12 air plug drills, and two steam pumps. The cutting plant at the firm's shed one-half mile south of Bethel village comprises one derrick, a 30-ton, a 20-ton and a 10-ton overhead electric crane, two air compressors (capacity 1,200, and 260 cubic feet of air per minute,) four air plug drills, 32 air hand tools, three surfacers, a polisher, and a 300-horsepower dynamo. Electricity is brought five miles from White River for this plant and sent four miles farther to the quarry.

Rochester.

The Liberty Hill quarry is three miles south of Rochester village. Operator, Liberty Hill Granite corporation, Rochester, Vt. The granite "coarse white granite," is a quartz monzonite of slightly greenish white color.

Windsor.

The state map of 1861 shows a granite area in the southern parts of Windsor and West Windsor and the northern part of Weathersfield. "Windsor granite" is a hornblende-angite granite which when first quarried becomes dark olive. The plant of the quarry comprises three derricks and two hoisting engines. At the cutting shed in Windsor it includes two hand derricks, an overhead 8-ton crane, a 50-horsepower engine, an air compressor, a cutting and a polishing lathe for stones 5 feet 6 inches by 1 foot 6 inches, and a set of twelve chilled shot saws for blocks 12 feet long. Transportation is by gravity track 600 feet long and 30 per cent grade from the quarry to road and thence by cartage 8½ miles to Windsor. The produce is used mainly for dies, wainscotting and indoor columns. Specimens: The two monolithic sarcophagi in the McKinley mausoleum at Canton, Ohio.

The Norcross quarry is on the north side of Mount Ascutney. Operator, Windsor Green Granite company, Worcester, Mass. The quarry is only operated occasionally.—Monumental News.